# Automatic Fridge Switch for Caravans

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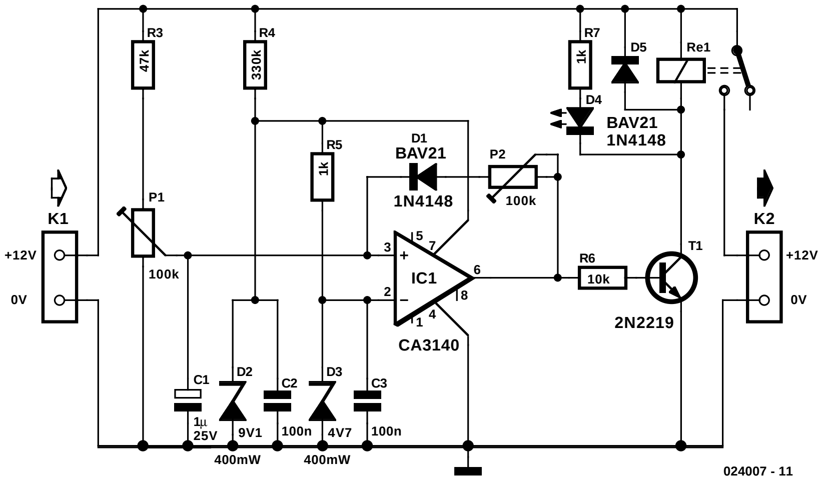

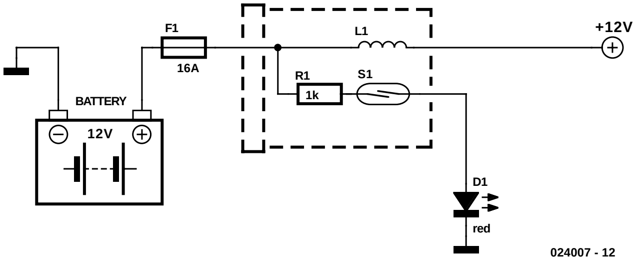

At last there is another project for caravan owners. They are probably all aware of the problems of a flat battery when they've forgotten to turn off the fridge after the engine has been switched off. When this circuit is installed between the fridge and (caravan) battery, these troubles will be a thing of the past. This simple, but smart, switch reacts to the increase in voltage that occurs when the engine is running. Whereas the normal battery voltage is 12 V, this increases to a minimum of 13.8 V when the alternator charges it. With a suitably configured comparator this voltage difference can easily be detected, and as can be seen, the circuit consists of little more than a 3140 comparator and a relay driver stage for switching the fridge.

P1 sets the voltage at the non-inverting input of the comparator such that the relay will only be powered when the battery voltage is above 13.8 V, so only when the engine is running. The hysteresis introduced by D1/P2 stops the relay from turning off as soon as the engine stops and the battery voltage drops a little. P2 is used to set the exact cut-off point and this preset should be set to a voltage at which the battery has not discharged too much; 11.5 V would be a suitable value. The fridge remains working until the battery voltage drops to this critical level, at which point it will turn off.

It is the intention that the circuit is mounted inside the caravan, between the fridge and the 12 V line coming from the car. This assumes that a 7-pin trailer socket is used, which has a single constant supply on pin 2. When a 13-pin connector is used, the circuit could also be mounted inside the car and switch the battery voltage going to pin 10. The fridge should obviously be powered via this pin too.

Here's a tip: The circuit isn't limited just for use with fridges. The same circuit could for example be used to automatically switch on the car lights whilst the engine is running. This really is a multi-purpose circuit.

For those of you who wish to verify that the circuit operates correctly, the author has designed a LED indicator that lights up when a current greater than 3 A is drawn from the supply. A special property of this circuit is that it introduces virtually no voltage drop in the supply. It consists of little more than a reed switch with several turns of 4 mm diameter wire wound round it (8 turns were found to be sufficient for the prototype). The reed switch is turned on by the magnetic flux created by the coil and switches on a LED that can be mounted on the dashboard. The reed switch and coil would fit perfectly in a 35mm film canister.

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